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POLYCHAETOUS ANNELIDS FROM AMOY, CHINA

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C. C. A. Monro (1934) has listed 40 species of polychaets from the coast of China, most of which were from Amoy and collected by Dr. T. Y. Chen, of the University of Amoy. The following report is upon a smaller collection of annelids, also made by Dr. Chen, from the neighborhood of Amoy and presented by him to the United States National Museum. It comprises but 31 specimens yet represents 21 species. Eight are apparently new: Two species of polynoids, *Lepidonotus minutus* and *Lepidasthenia ocellata;* a leodicid, *Marphysa orientalis;* four nereids, *Nereis* (*Neanthes*) *linea*, *N.* (*Neanthes*) *orientalis*, *N.* (*Nereis*) *amoyensis*, and *N.* (*Leptonereis*) *distorta;* and a cirratulid, *Cirratulus branchiatus.* Only five—*Chloeia flava*, *Lysidice collaris*, *Marphysa sinensis*, *Nereis* (*Neanthes*) *oxypoda*, and *Nephthys sinensis*—are common to both collections.

The material on the whole is well preserved, but since in most cases only one individual of a species is present, there is a degree of uncertainty in the diagnosis of new species. Monro made similar comment on the collections he studied.

Family AMPHINOMIDAE

Genus CHLOEIA Savigny

CHLOEIA FLAVA (Pallas)

Aphrodita flava Pallas, 1766, p. 97–102, pl. 8, figs. 7–11.

One specimen (Chen no. 21).

Family POLYNOIDAE

Genus LEPIDONOTUS Leach

LEPIDONOTUS MINUTUS, new species

Two very small specimens, both tightly coiled so that measurements are hard to get, but they are about 7 mm long and 2.5 mm wide. From their small size I at first thought that they must be young, but since one contains mature eggs they obviously are adult. There are 12 pairs of elytra, completely covering the body.

The prostomium is longer than wide, its posterior margin overlapped by the nuchal fold, and is unusual in having no lateral bulgings or curves, the posterior diameter being only a little greater than the anterior. There are two pairs of subequal eyes, both pairs visible from above and situated rather in front of the middle of the prostomium (fig. 18, *a*). The cirrophore of the median tentacle is a trifle larger than those of the lateral, and its style extends only a short distance beyond the lateral ones. All are of uniform diameter except at the ends, where they narrow to form very delicate tips, those of the lateral ones being longer than that of the median. The basal two-thirds of each style is darker than the apex, but there is no definite pigmentation. The palps are not very large and reach to only a short distance beyond the tentacles. The tentacular cirri are very similar to the tentacles.

In the parapodium (fig. 18, *b*) is a heavy dorsal cirrus that extends beyond the setal lobe. The notopodium is recognizable only by the position of the acicula and the small tuft of setae arising direct from the body wall. The posterior lip of the neuropodium is truncate at the end, and from there its ventral margin extends downward as also a straight line, making an angle of about 45° with the end. The anterior lip, into which the acicula extends, is more conical. The ventral cirrus is slender and does not reach the end of the parapodium.

In the notopodium are two kinds of slender colorless setae. Both have slender stalks and carry two rows of fine-toothed plates. In one kind the stalk is short and ends in a rounded apex, being free from plates for an appreciable distance from the end. In the others, which are more than twice as long as the first, the stalk is drawn out into an exceedingly fine point, and toothed plates extend nearly or quite to the end. This point is difficult to determine with accuracy, since the stalk becomes very slender and the plates exceedingly small. It is quite possible, in fact, that the terminal denticulations are, as have been described in other species, fine teeth and not toothed plates. It may be that the shorter of these setae are really broken specimens of the longer type, but the ends seem too well rounded and entire for that. The neuropodial setae are of only one kind, all much heavier than the notopodial (fig. 18, *c*). They widen near the ends and then

narrow to a blunt point. On the concave surface of the terminal portion are about six toothed plates.

The elytra overlap on the mid-dorsal line of the body. They are oval in outline, and the greater part of the surface is covered by pig-

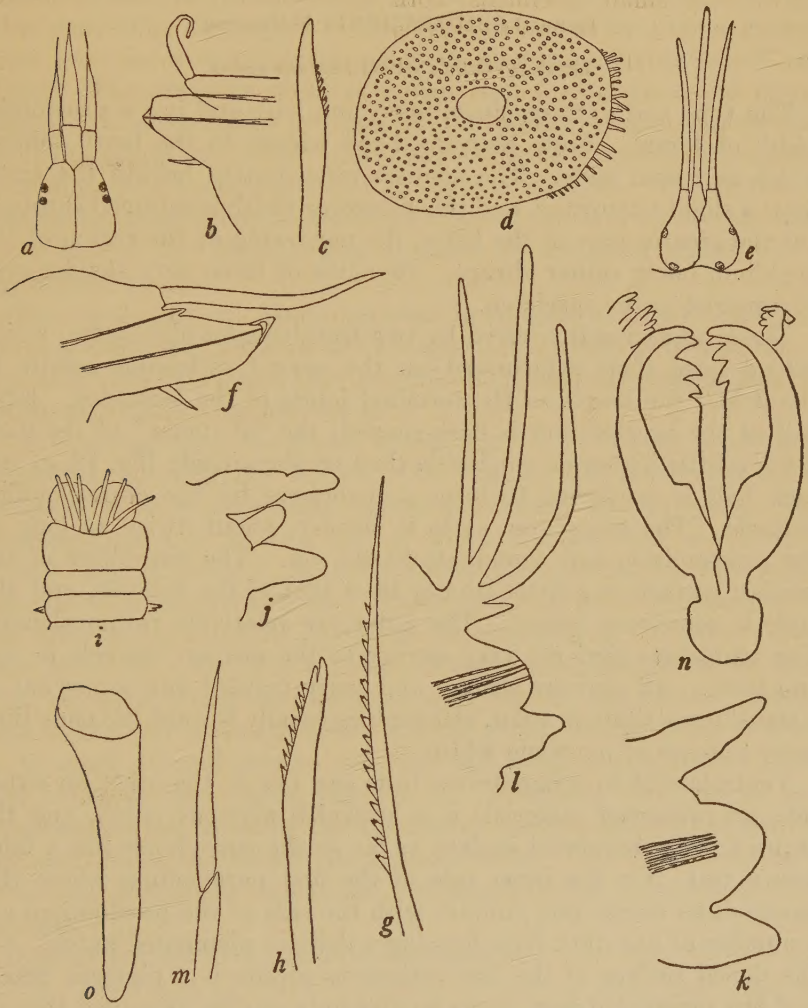

FIGURE 18.—New species of LEPIDONOTUS, LEPIDASTHENIA, and MARPHYSA.

a-d, Lepidonotus minutus: a, Prostomium, × 20; *b*, parapodium, × 27; *c*, seta, × 185; *d*, elytron, × 45.

e-h, Lepidasthenia ocellata: e, Prostomium, × 10; *f*, parapodium, × 15; *g*, slender toothed seta, × 185; *h*, ventral seta, × 68.

i-o, Marphysa orientalis: i, Anterior end, × 4; *j*, first parapodium, × 22.5; *k*, tenth parapodium, × 22.5; *l*, middle parapodium, × 18; *m*, compound seta, × 185; *n*, maxilla, × 9; *o*, half of mandible, × 9.

ment patches, which are denser near the point of attachment and extend to the outer lateral margin, leaving the other margins clear (not shown in fig. 18, *d*). Blunt spines are scattered at about equal

distances over the entire surface (fig. 18, *d*). On the posterior margin is a row of papillae of varying sizes, but the rest of the margin is entire.

Type.—U.S.N.M. no. 20112 (Chen no. 19).

Genus LEPIDASTHENIA Malmgren

LEPIDASTHENIA OCELLATA, new species

The type and only specimen is 85 mm long and has a prostomial width of 1 mm. From here the body widens to the tenth somite, which is 5 mm wide. The somites immediately behind the tenth show a slight narrowing, and this narrower width is retained throughout the greater part of the body, the narrowing at the region of the pygidium being rather abrupt. Remains of three very slender anal cirri persist in the specimen.

The head region is covered by two translucent white elytra, which extend from their attachment on the second setigerous somite to about half the length of the terminal joints of the tentacles. Each half of the prostomium is flask-shaped, the "shoulder" of the flask being a little higher on the inside than on the outside (fig. 18, *e*) and each half is continued to form a cirrophore for the corresponding tentacle. The tentacular style is slender, about twice as long as the prostomium, and acuminate at the tip. The cirrophore of the median tentacle is a little stouter than that of the laterals, and the style is somewhat longer. The palps are relatively rather slender. The tentacular cirri are very similar to the median tentacle in size and form. All cirri are slender and sharp-pointed and somewhat of a translucent white in color, although especially toward the ends they carry patches of porcelain white.

Ventrolateral to a line drawn from one eye to the other on either side (in preserved material) is a brownish pigment patch, and the entire dorsal prostomial surface as far as the cirrophores has a faint brown tint. On the inner side of the first parapodium where this parapodium comes into contact with the side of the prostomium are a number of fine dark lines forming a definite pigmented patch. On the dorsal surface of the first setigerous somite is a pigment patch, and fine pigmented lines occur on alternate somites (the ones that do not carry elytra). These at first are somewhat irregular, but by the eighteenth somite the dorsal surfaces have definite pigment patches formed of fine lines arranged longitudinally. A very little pigment occurs at the base of each elytrophore. Beginning with the first somite the dorsal surface between the above mentioned pigment patches is colorless but has pigment on either side. This colorless middle region is most noticeable in the first two somites, and by the fifth the pigment has covered the middle region as well. The general

effect is that of a dorsomedian dark area covering more than half of the dorsal surface, the pigment being in the form of very fine lines drawn transversely. By the fifteenth somite the lateral margins of this area have become noticeably darker than the remainder. This pigmentation continues throughout the greater part of the body but later gradually disappears. The appearance of the living animal must have been considerably affected by the pigmentation of the elytra. The first two of these remain and are colorless and translucent. Most later ones are lost, but the eighth remains, and in this, while in general the translucence remains, there is a patch of pigment extending from its base halfway to its outer margin. The elytron is sufficiently translucent to produce an ocellated effect by the colorless outer end of the elytrophore, bounded on its inner margin by a pigmented band.

The elytra are all nearly circular in outline and have perfectly smooth margins. They occur throughout the body, at first alternating with cirri but posteriorly several cirrus-bearing somites may lie between two of the elytron carriers.

In a parapodium the dorsal cirrus (fig. 18, *f*) is very prominent, extending considerably beyond the end of the setal lobe. The notopodium is rudimentary, having an acicula but no setae. The neuropodium ends in two lips of which the anterior is the more pointed and the longer. Between the lips is a rounded lobe into which the end of the acicula extends. From the dorsal to the ventral part of the setal lobe is a definite change in the character of the setae. Dorsally there are a few (3 in the one drawn) slender sharp-pointed setae (fig. 18, *g*) carrying on one margin a row of fine-toothed plates. Just ventral to these are much heavier setae, nearly twice as thick as to shaft, curved toward the ends and bifid at the apex. These also carry toothed plates (fig. 18, *h*). Ventrally this type of seta becomes smaller, those at the very lower end being hardly thicker in the shaft than the slender dorsalmost setae. The ventral cirrus is small and located at about half the length of the parapodium from its base.

Type.—U.S.N.M. no. 20113 (Chen no. 32).

Family ACOETIDAE

Genus PANTHALIS Kinberg

PANTHALIS PANAMENSIS Chamberlin

Panthalis panamensis Chamberlin, 1919, pp. 86–89; pl. 11, figs. 4–8; pl. 12, figs. 1–6.

An incomplete fragment 25 mm long (Chen no. 47). I was unable to find all the kinds of setae described by Chamberlin as occurring in

the first setigerous somite, but probably this was due to the poor condition of the specimen and the loss of some of the somites.

Family LEODICIDAE

Genus DIOPATRA Audouin and Milne Edwards

DIOPATRA NEAPOLITANA Chiaje

Diopatra neapolitana CHIAJE, 1841, p. 97.—FAUVEL, 1932b, p. 144; 1933, pp. 28–37,fig. 4, a–d.

One specimen (Chen no. 34).

Genus LYSIDICE Savigny

LYSIDICE COLLARIS Ehrenberg, Grube

Lysidice collaris GRUBE, 1868, p. 633; 1869, p. 495.—VON MARENZELLER, 1879, pp. 136–137, pl. 5, figs. 2, 2A, 2B.

Two specimens (Chen nos. 28, 35), one incomplete, identified from von Marenzeller's description.

Genus LUMBRINEREIS Blainville

LUMBRINEREIS HETEROPODA (von Marenzeller)

Lumbriconereis heteropoda VON MARENZELLER, 1879, pp. 138–139, pl. 5, figs. 4, 4A, 4B; pl. 6, figs. 1, 1A, 1B.

A single incomplete specimen (Chen no. 33) retaining about 50 of the anteriormost somites. The only differences that I could discover between this and von Marenzeller's description are that the teeth on the large maxillary plate are heavier than in the Japanese specimen and that hooked setae occur in somites anterior to the thirty-fifth.

Genus MARPHYSA Quatrefages

MARPHYSA SINENSIS Monro

Marphysa sinensis MONRO, 1934, pp. 367–369, fig. 5.

The two specimens (Chen no. 45) agree with Monro's description in the apparent absence of pectinate setae in the anterior somites and in the presence of compound setae whose terminal joints show a faint longitudinal grooving (Monro's fig. 5E). In other species of *Marphysa* the pectinate setae are hard to find in anterior somites, so that the peculiar compound setae are possibly the only essential difference between this species and *M. belli* Audouin and Milne Edwards. It might be questioned if this difference is of specific value and whether *M. sinensis* should not rather be listed as a variety of *M. belli*.

MARPHYSA ORIENTALIS, new species

The type and only specimen is 200 mm long and has a prostomial width of 3.5 mm and a peristomial width of 5 mm. From the prostomium the body gradually widens to about the fortieth somite,

where it is 8 mm in diameter. Throughout the rest of the body the diameter is somewhat less than this, and at the pygidium there is an abrupt narrowing.

The prostomium (fig. 18, *i*) is distinctly bilobed, the dorsal longitudinal depression extending about halfway to the peristomial border. The outer right tentacle has been lost, but the others are all about of the same size, only a little longer than the prostomium. Setigerous somites 2 to 4 are all of about the same length, about half that of the peristomium. Later ones are about half as long as these. In the preserved material the body color is brown with marked iridescence.

The first parapodium (fig. 18, *j*) has its setigerous portion a little posterior to the bases of the dorsal and ventral cirri and carrying a prominent bundle of compound setae, which extend beyond its dorsal and ventral surfaces. There are three heavy aciculae. The dorsal cirrus is about twice as long as the setal lobe, its apex bluntly rounded. The ventral cirrus is about three-fourths as long as the dorsal but is broader and its apex blunter. In the tenth parapodium (fig. 18, *k*) the setal lobe is relatively larger than in the first and is in the form of a rounded lobe from whose anterior face a tuft of setae extends dorsally and ventrally as well as along the face of the lobe. The dorsal and ventral cirri are, relative to the setal lobe, much slenderer than in the first but retain their relative sizes with respect to one another. Aciculae make up a dense black mass in the setal lobe, coming to the surface among the setae. The ventral setae of the setal tuft are compound, the dorsal one simple, and the ventralmost ones are quite short, while those at the top of the bundle extend beyond the ends of the dorsal cirrus. A parapodium from the middle of the body (fig. 18, *l*) has a less prominent setal lobe than is the case in the anterior ones and the setae are fewer in number. The ventral cirrus is an inconspicuous cone attached to the end of a ventral swelling, which is fused for nearly its whole length to the ventral face of the setal lobe. In addition to setae like those found farther forward, there are pectinate ones in the dorsal part of the bundle. The dorsal cirrus is a slender cone inserted much above the setigerous portion and attached to the base of the prominent gill.

In the type the thirty-fifth setigerous somite has one very small gill filament on the left side, but the series really begins on the forty-fifth, and they extend to within about 30 somites from the pygidium. I saw none that had more than three filaments, and posteriorly they have only one. There is one pair of small anal cirri.

The simple setae are relatively rather heavy in the stem and are long and gently curved to sharp points. Compound ones (fig. 18, *m*) have the terminal joint long and curved and tapering to sharp points. Aside from the jointing the general contours of the two kinds of setae are similar.

The maxillae are very dark. The carrier of the forceps is nearly circular at its base and is attached to the forceps by narrow stems (fig. 18, *n*). Each of the paired plates has three heavy teeth, the unpaired one has four, the right distal has four, and the left distal has three. The mandibles are dark brown and have slender stems (fig. 18, *o*). The beveled portions are covered with a thin whitish incrustation.

Type.—U.S.N.M. no. 20114 (Chen no. 25).

Family NEREIDAE

Genus NEREIS Cuvier

NEREIS (NEANTHES) OXYPODA von Marenzeller

Nereis (Alitta) oxypoda von Marenzeller, 1879, pp. 120–122, pl. 2, fig. 3.

A single specimen (Chen no. 27) lacking the posterior region. The pharynx was retracted, but so far as could be determined from dissection the paragnath formula agrees better with von Marenzeller's original description than with that of Fauvel, who reported it from the Gulf of Pei Tcheu Ly (1933, p. 22).

NEREIS (NEANTHES) LINEA, new species

Body length of type, 180 mm; prostomial width, 2.5 mm; peristomial width, 4.5 mm. At the sixth setigerous somite the body width (counting the parapodia) is 8 mm. From the fourteenth setigerous somite the body gradually narrows to the pygidium, which is 1 mm wide and carries one pair of long anal cirri.

The prostomium (fig. 19, *a*) is a little longer than its basal width and widens slightly from its posterior border to just in front of the anterior pair of eyes, where it narrows to about two-thirds of its basal width. It is difficult, however, to determine the precise boundaries of the prostomium, because it merges so gradually on either side into the basal joint of the palp. The anterior end is rather narrow, and the two conical tentacles are situated less than their own diameter apart. In the type the palps are bent ventrally and so do not show well in a dorsal view. The basal joint is heavy, the terminal one a mere knob, the basal joint extending in front of the tentacles. The posterior dorsal tentacular cirrus extends to the sixth setigerous somite, the anterior dorsal to the second, and the posterior ventral to the first, while the anterior ventral is shorter than the peristomium, all being very slender. On its lateral margins the peristomium is about two-thirds as long as the prostomium, while on the mid-dorsal line it is about half as long as on the margins. Setigerous somites 1 to 4 are about two-thirds as long as the mid-dorsal length of the peristomium, while later ones increase to twice this length. This latter length is continued throughout the greater part of the body. On the peristo-

mium and first 15 setigerous somites there are on either side 8 to 10 fine brownish lines starting at the posterior border and running antero-dorsally. The dorsalmost of these bend toward the dorsal mid line and do not reach the anterior margin. Others reach the margin, but

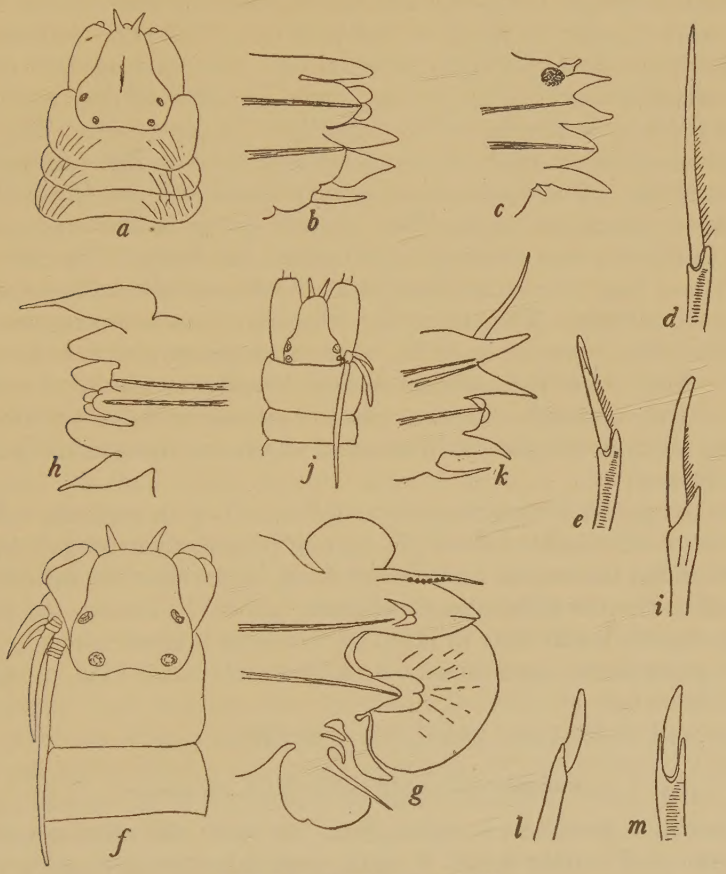

FIGURE 19.—New species of NEREIS

a–e, Nereis (Neanthes) linea: *a*, Anterior end, × 5; *b*, tenth parapodium, × 12; *c*, posterior parapodium, × 12; *d*, seta, × 300; *e*, seta, × 300.
f–i, Nereis (Neanthes) orientalis: *f*, Anterior end, × 5; *g*, epitokous parapodium, × 8; *h*, third parapodium, × 12.5; *i*, seta, × 50.
j–m, Nereis (Neanthes) amoyensis: *j*, Anterior end, × 7.5; *k*, thirtieth parapodium, × 45; *l*, seta, × 300; *m*, seta, × 300.

the lines of successive somites do not unite. A few are forked toward their anterior ends. In the first setigerous somite about one-fourth of the mid-dorsal area is free from these lines, and this free portion widens in later somites to occupy about half of the dorsal surface. Behind the fifteenth somite the lines gradually shorten and are not found behind the twenty-second.

The first parapodium is uniramous and has a large ovate dorsal lip and a long, slender dorsal cirrus. An acicula comes to the surface at the apex of the conical posterior lip of the setal lobe. There are two subequal, rounded anterior lips. The tenth parapodium (fig. 19, *b*) has well-developed notopodia and neuropodia, the notopodium being essentially similar to the first parapodium. The neuropodium has practically no posterior lip to the setal lobe, but there are two prominent anterior ones. The ventral cirrus is very slender, extending about halfway to the tips of the setal lips. A later parapodium (fig. 19, *c*) has on the notopodium a conical dorsal, and on the neuropodium a ventral, lip. The dorsal cirrus is very small, and just inside it is a prominent pigment patch. The ventral cirrus is also very small. Two kinds of setae are found throughout the body. The first (fig. 19, *d*) have long pointed terminal joints, which carry hairlike processes along one margin. The others (fig. 19, *e*) have much shorter terminal joints, which, however, have the same arrangement of hairlike processes. The end of the terminal joint is bluntly rounded and appears to be slightly twisted. In some cases it seemed as if there were setae having short denticulations instead of the hairs, but probably these were broken.

The paragnath arrangement is as follows: I, 4, in a group, 1 larger in front and 3 smaller behind; II, arcs of irregularly arranged 2 rows, the 4 nearest the middle in each row being larger than the others; III, a roughly circular diffuse patch of paragnaths; IV, 2 rows, the paragnaths slightly larger than in III; V, 3 in a longitudinal row; VI, 2 or 3 large paragnaths, transversely arranged; VII and VIII, a double continuous row.

Type.—U.S.N.M. no. 20115 (Chen no. 29).

NEREIS (NEANTHES) ORIENTALIS, new species

The single specimen is incomplete, but since the diameter at the posterior end is only 4 mm it seems probable that not much of the body has been lost. What remains is 76 mm long and has a prostomial width of 3.5 mm.

The prostomial width is about equal to its length, and its posterior margin has rounded ends and a slight emargination in the mid-dorsal line. The diameter of the posterior margin is retained as far as just in front of the anterior eyes, where it narrows by about the diameters of the two eyes. From here the lateral margins extend nearly straight forward to the broadly rounded anterior lateral angles (fig. 19, *f*). In the middle of the dorsal surface is a slitlike longitudinal depression, which may have been caused by the preservation methods. The eyes are nearly equal in size, one pair located as mentioned above, the other near the posterior margin, the lenses of the posterior pair looking dorsally, those of the anterior anterolaterally. The tentacles are not

more than one-fifth the length of the prostomium and are conical in outline. They are separated by more than their own diameter from each other. The prostomial region is more or less distorted by the partially protruded pharynx, and the palps have an abnormal appearance due either to this pressure or to imperfect preservation. In their present condition the basal joint of each palp is about half as wide as the prostomium and is much wrinkled, while the terminal joint is a mere button inserted in the end of the basal (not shown in fig. 19, *f*). The longest tentacular cirrus reaches to the third setigerous somite, the next longest to the second, the next to about the middle of the first, and the fourth is shorter than the peristomium. The specimen is in the epitokous condition, which does not seem to have affected the anterior region but shows first in parapodial changes at the region of the twenty-fifth parapodium.

A parapodium taken from the middle of the epitokous region (fig. 19, *g*) is 6 mm in vertical diameter. The setal portion of the notopodium ends in two lobes of which the posterior one is itself bilobed and a little longer than the anterior. An acicula comes to the surface at the ventral face of the anterior lobe, and a fan-shaped bundle of setae, attached to the anterior side of the lobe near its base, covers the whole anterior face of the notopodium. A two-lobed "fan" is attached to the posterior parapodial surface, each lobe narrowing toward the end, so that as the two lie in contact with each other the whole has an ovate outline. Another fan-shaped lobe covers the dorsal surface of the notopodium, its point of attachment being median to that of the dorsal cirrus. The dorsal cirrus extends beyond the notopodial apex and has the peculiar lobed border characteristic of the epitokous phase, except that instead of being mere crenulations they are eight definite rounded thickenings of the surface. The terminal lobes of the neuropodium are quite similar to those of the notopodium except that they are larger. There is also the vertical row of setae and the large anterior "fan." Attached to the lower surface of the neuropodium is a process whose outline might be described as a distorted oblong. The ventral cirrus is about as long as the notopodium and has a broad fan attached to its base. On its dorsal surface are two peculiar finger-shaped processes.

Anterior parapodia (fig. 19, *h*) have thick, heavy dorsal and ventral lips. The notopodium carries a posterior lobe similar in outline to the dorsal lip but is not quite so large and there is no anterior lobe. The neuropodium has bilobed anterior and posterior terminal lips. The dorsal cirrus is heavier than the dorsal lip, and toward the apex it terminates in a very narrow portion. The ventral cirrus is also heavy, its base narrower than its median portion but its apex narrow. There is a single acicula in each lobe.

In anterior somites the neuropodial setae are much larger than the notopodial, their basal joints homogomph and markedly cross striated. Their terminal joints are long, gently curved to sharp apices, and finely denticulated along the concave border. In the notopodium are two kinds of setae neither of which protrudes from the surface as much as do the neuropodial. Those of the ventral part of the tuft are similar to the neuropodial. Those of the dorsal part have heterogomph transversely striated basal joints, the terminal joints being short and blunt-ended and carrying a row of stiff spines along one margin (fig. 19, *i*). The setae of the posterior portion of the body have the broad paddle-shaped terminal joints characteristic of the epitokous phase.

The paragnath arrangement is: I, 2, one behind the other; II, 8 pairs, each being almost dumb-bell shaped, the first 6 pairs larger than the others; III, numerous paragnaths arranged in 4 transverse rows, with 4 smaller ones at either end; IV, 4 or 5 large paragnaths with scattered smaller ones in front and behind; V, 1 large and several smaller ones; VI, 2 large ones; VII and VIII, 2 irregular transverse rows. Each jaw is a curved dark-brown plate without any marginal denticulations.

Type.—U.S.N.M. no. 20116 (Chen no. 26).

NEREIS (NEANTHES) AMOYENSIS, new species

The single specimen is incomplete, retaining the first 45 somites, which in length measure 27 mm. The prostomial width is 1 mm, the peristomial 1.5 mm. The widest region is in the neighborhood of the tenth setigerous somite.

The prostomium (fig. 19, *j*) has a length a little greater than its breadth, and the eyes are separated from each other by less than their own diameters. The prostomium narrows immediately in front of the anterior eyes, about one-third of its length from the posterior border. The tentacles are less than one-third as long as the prostomium and are separated at their bases by a distance less than their own diameters. The basal joints of the palps extend to the ends of the tentacles. In both palps the terminal joints are broken but look as if originally they were rather narrow cylinders. The tentacular cirri are slender and short, the longest barely reaching the anterior border of the third setigerous somite. All other tentacular cirri are shorter than the peristomium.

The prostomium is twice as long as the first setigerous somite. Later somites show slight increases in length up to the tenth, this latter length being retained throughout the rest of the fragment.

The thirtieth parapodium (fig. 19, *k*) has conical lips on the notopodium, the setal portion not showing as a definite lobe. The dorsal cirrus is very long and slender, and there are two aciculae in the noto-

podium. The neuropodium has a conical presetal and two rounded postsetal lobes and a single acicula. There is one sharp-pointed ventral lip much like those of the notopodium in outline and a ventral cirrus reaching nearly to the end of the lip.

There are three kinds of compound setae. The first have very slender terminal joints that are faintly serrated along the slightly curved border; the second (fig. 19, *l*) have short terminal joints bluntly rounded at the ends and without teeth; and the third, stout setae found only in the notopodium, have the terminal joint inserted in a notch in the end of the basal (fig. 19, *m*).

The paragnath arrangement is: I, 1 very dark tooth; II, irregular groupings of 2 or more; III, a transverse group of 15 or so, the outer ends of each group being wider than in the middle; IV, a single irregular row; V, absent; VI, a rounded patch of 6 to 8; VII and VIII, together a rather broad irregular patch with a single row of larger paragnaths anterior to the others.

Type.—U.S.N.M. no. 20117 (Chen no. 31).

NEREIS (LEPTONEREIS) DISTORTA, new species

A single male specimen in the epitokous phase. The body is not complete, but from the small size of the posterior end of the fragment it appears that not much has been lost. It is 70 mm long, with a diameter of 8 mm at the seventh parapodium. This diameter is retained for about 15 somites, and then there is a gradual decrease in width toward the posterior end. The prostomial width is 2 mm, the peristomial 3.5 mm. The three somites following the peristomium are scarcely wider than it and are very short (fig. 20, *a*). From the fourth to the eighth setigerous somites there is a rapid increase in length and breadth, the eighth being two and a half times the width and three to four times the length of the peristomium. Possibly some of these differences are due to distortion caused by preservation methods.

The prostomium (fig. 20, *a*) is wider than long, with prominent eyes of which the anterior pair are more than twice as large as the posterior and have lenses pointed anterolaterally. The posterior eyes are distant by about their own diameter from the anterior, and their lenses point dorsally. The posterior margin of the prostomium is overlapped dorsally by the peristomium, which in the specimen partly covers the eyes. In figure 20, *a*, this is drawn as if turned back. The posterior margin of the prostomium is straight and its lateral angles rounded. It is widest just in front of the anterior eyes and then narrows by about the eye diameters. It is rounded anteriorly and divided into two parts by a definite but not very deep dorsal longitudinal incision and an anterior marginal invagination. The tentacles are conical, colorless, about one-eighth as long as the

prostomium, and situated near the outer anterior prostomial angles. The basal joint of the palp is long and cylindrical and extends almost to the ends of the tentacles. The terminal joint is a mere knob. The dorsal posterior tentacular cirrus extends to the middle of the sixth setigerous somite, the dorso-anterior to the fourth, the ventro-posterior to the third, and the ventro-anterior to the first. The peristomium is hardly more than one-third as long as the prostomium and is a trifle longer in the mid-dorsal line than on either edge.

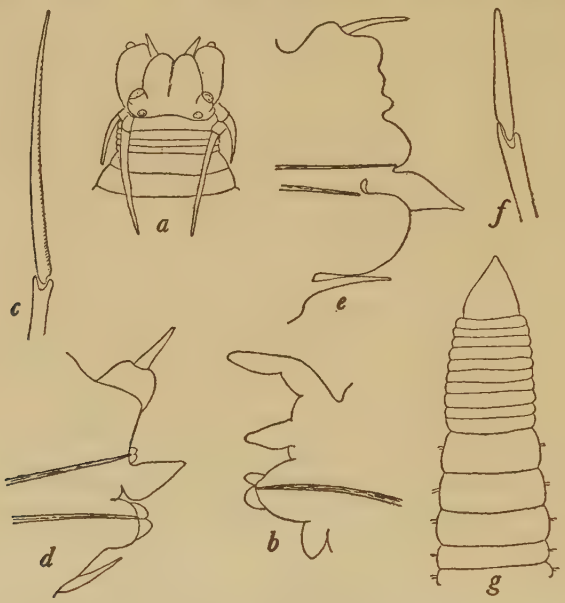

FIGURE 20.—New species of NEREIS and CIRRATULUS

a–f, Nereis (Leptonereis) distorta: a, Anterior end, × 5; *b,* first parapodium, × 18; *c,* anterior seta, × 300; *d,* eighteenth parapodium, × 12; *e,* thirtieth parapodium, × 12; *f,* second form of seta, × 300.

g, Cirratulus branchiatus: Anterior end, × 10.

Except for the peristomium and first three setigerous somites, the body is much distended with sperm. The first parapodium (fig. 20, *b*) has a prominent dorsal cirrus and conical notopodial lip but no setal lobe or acicula. The neuropodial setal lobe has rounded anterior and bifid posterior lips and a single acicula. The setae are all compound and homogomph, the terminal portion slender and elongated but not much curved, and finely toothed along one margin (fig. 20, *c*). Since from most of these the terminal joint has been broken, I am unable to say whether they are all alike. A notopodial acicula first appears in the third parapodium and is accompanied by a few setae essentially like those of the neuropodium but much smaller, so that under a hand lens the neuropodial setae appear to be the only ones

present. In this somite also the dorsal cirrus has a heavy basal joint to which the cirrus proper is attached. This becomes much more marked in later somites. There is a short ventral cirrus.

In the eighteenth parapodium (fig. 20, *d*) there is a notopodial acicula and small bilobed posterior lip on the setal lobe. The dorsal cirrus is attached to the basal lobe above mentioned and there is a lip just ventral to the setal lobe. The neuropodium is not noticeably different from the first, but the ventral cirrus is slender. The thirtieth parapodium (fig. 20, *e*) has prominent bundles of setae on both neuropodium and notopodium, extending fanwise so that they overlap. Dorsal to the notopodial setal lobe the parapodium is decidedly elevated, and the dorsal cirrus lies in a depression on its upper margin. The conical lip seen in earlier somites is still present, ventral to the setal lobe, which has rounded anterior and posterior lips of which the former is the longer. The neuropodial setal lobe also has two rounded lips, and the ventral cirrus is much as it was in the eighteenth parapodium.

In the eighteenth parapodium are a few notopodial setae of the general form of figure 20, *f*. In the neuropodium are two tufts, one above and one below the acicula. The majority are as shown in figure 20, *c*. In each tuft are smaller numbers of a second form (fig. 20, *f*). In these the basal joint is heterogomphous, the terminal joint short, blunt-pointed, and without teeth.

In the subgenus *Leptonereis* there are no paragnaths on the pharynx. In *N.* (*L.*) *distorta* the jaws are dark brown, gently curved, and each with about 16 subequal teeth.

Type.—U.S.N.M. no. 20118 (Chen no. 22).

Family GLYCERIDAE

Genus GLYCERA Savigny

GLYCERA ROUXII Audouin and Milne Edwards

Glycera rouxii Audouin and Milne Edwards, 1834, p. 242–243, pl. 6, figs. 5–10.—Fauvel, 1933, p. 43.

Fauvel (1933, p. 43) decided that von Marenzeller's *G. decipiens* (1879, pp. 140–142, pl. 6, fig. 3) is synonymous with *G. rouxii*, and since he had an opportunity of comparing the Chinese with the Mediterranean specimens his identification probably is correct. My single specimen (Chen no. 24) agrees with Marenzeller's and Fauvel's descriptions but differs in some respects from the diagnosis given by Audouin and Milne Edwards.

Family NEPHTHYDIDAE

Genus NEPHTHYS Cuvier

NEPHTHYS SINENSIS Fauvel

Nephthys sinensis FAUVEL, 1932a, p. 536, fig. 1, a–c; 1933, pp. 40–42, fig. 5.—MONRO, 1934, pp. 363–365, fig. 2.

A single specimen (Chen no. 49) broken in the middle but with apparently none of the body lost. I have listed it as *N. sinensis* following Monro, because the prostomium structure agrees perfectly with his description, and the differences between his figure of the parapodium and mine might be accounted for by distortions due to preservation methods. His figure of the parapodium, however, is quite different from Fauvel's, the differences being as great as are those separating other species of the genus. It seems probable that a study of a larger number of specimens would demonstrate that this is a new species.

A prostomial peculiarity in my material not mentioned or figured by Monro is that the anterior tentacles can be traced as thickenings for a considerable distance back on the surface of the prostomium, and the anterior prostomial area lying between these tentacles is so translucent that it looks like a web connecting the tentacles.

Family CIRRATULIDAE

Genus CIRRATULUS Lamarck

CIRRATULUS BRANCHIATUS, new species

The body of the type and only specimen is about 45 mm long, the peristomial diameter being slightly greater than the prostomial, which is about 0.75 mm. The somites following the peristomium show a gradual increase in width, the greatest width being reached posterior to the middle of the body where for about 25 somites the width is 3 mm. Behind this there is a gradual decrease to the very narrow pygidium. It is not possible to determine to what extent these differences are due to the effects of preserving fluids.

The prostomium (fig. 20, *g*) is conical, its width a little less than its length and with no eyes visible. Because of numerous surface wrinklings, which exactly imitate somite boundaries (fig. 20, *g*), the latter are difficult to determine, but apparently there are three achaetous somites, this achaetous portion being about twice as long as the prostomium. On its anterior border it is a little wider than the prostomium, and this width hardly changes to its posterior border. The first three setigerous somites are each about one-fourth as long as the achaetous portion, the fourth and fifth are each about one-third shorter than these, the sixth and seventh are still

shorter, and succeeding ones are not more than one-third to one-half the length of the first setigerous somite.

Gills appear on the first somite, and while only a few are retained they apparently occur throughout the body, some of the posterior ones being longer than the body diameter. The tentacles lie in a transverse row on the dorsal surface of the fifth setigerous somite. One of the these (unfortunately broken off during examination) was 0.4 mm in diameter at the base, and its length was several times the diameter of the body. Owing to extensive coiling the precise length was not possible to get. Probably originally there were on either side one large tentacle and several smaller ones, the whole forming a continuous band across the dorsal surface of the somite.

Setae of anterior somites are very slender and extend much farther from the body surface than do those of later somites. They curve gently to an acute point, and in some very minute roughnesses may be seen along one margin. Occasionally these seem regular enough to be listed as denticulations, but usually they are very irregular and may in most cases be merely minute grains of foreign matter attached to the seta. On either side of the posterior somites are two setal tufts composed of about six moderately heavy spines, which narrow slightly and then curve toward the blunt end, and a few slender setae similar to those in anterior somites but much less prominent.

Type.—U.S.N.M. no. 20119 (Chen no. 15).

Family MALDANIDAE

Genus EUCLYMENE Verrill

EUCLYMENE ANNANDALEI Southern

Euclymene annandalei Southern, 1921, p. 648, pl. 28, fig. 22, a–g; pl. 29, fig. 22, h–k.

Clymene (*Eyclymene*) *annandalei* Fauvel, 1932b, p. 199; 1933, p. 51.

In only three points does this specimen (Chen no. 9) differ from Southern's description. The first is that there are two instead of a single uncinus in the neuropodium of anterior somites. According to Chamberlin (1919, p. 409) *Euclymene* has only one of such setae, the alternative being *Paraxiothea* Webster, in which they are "numerous." Since two can hardly be considered as numerous, I have listed them as *Euclymene*. Fauvel calls it the genus *Clymene*, a name that is preoccupied (Chamberlin, 1919, p. 410).

A second difference is that the dorsal setae in the posterior somites remain in a tuft and do not arch over and around the ventral. A third is that while Southern found 14 to 24 cirri on the margin of the anal funnel, this has 30. Since none of these characters seems to be of specific importance, I have listed the specimen as above.

Family SABELLIDAE

Genus SABELLASTARTE Krøyer

SABELLASTARTE FUSCA (Grube)

Sabella fusca GRUBE, 1869, p. 516.—McINTOSH, 1885, pp. 491–492, pl. 52, fig. 3; pl. 30A, figs. 4–6.

I have identified this specimen (Chen no. 16) from McIntosh's description. Having only one form of seta in the anterior tori, it is a *Sabellastarte* rather than a *Sabella.*

Genus DASYCHONE Sars

DASYCHONE ORIENTALIS McIntosh

Dasychone orientalis McINTOSH, 1885, pp. 498–500, pl. 52, fig. 5; pl. 30A, figs. 19–21; pl. 39A, fig. 4.

The identification of this specimen (Chen no. 16) is made with some hesitation, since McIntosh's description was based on an imperfect specimen and was therefore incomplete. In essential respects it agrees with his original description.

Family TEREBELLIDAE

Genus THELEPUS Leuckart

THELEPUS JAPONICUS von Marenzeller

Thelepus japonicus VON MARENZELLER, 1884, pp. 208–209, pl. 2, fig. 4

A single specimen (Chen no. 12).

LITERATURE CITED

AUDOUIN, JEAN VICTOR, and MILNE EDWARDS, HENRI.

1834. Recherches pour servir à l'histoire du littoral de la France, etc., vol. 2, Annélides, 290 pp., 8 (=18) pls.

CHAMBERLIN, RALPH VARY.

1919. The Annelida Polychaeta. Mem. Mus. Comp. Zool., vol. 48, 514 pp., 80 pls.

CHIAJE, STEFANO DELLE.

1841. Descrizione e notomia degli animali invertebrati della Sicilia citeriore, osservati vivi negli anni 1822–30, vol. 3.

FAUVEL, PIERRE.

1932a. Polychètes nouvelles de Che-Foo (Chine). Bull. Mus. Hist. Nat., ser. 2, vol. 4, no. 5, pp. 536–538, fig. 1, a–k.

1932b. Annelida Polychaeta of the Indian Museum, Calcutta. Mem. Indian Mus., vol. 12, no. 1, 262 pp., 9 pls.

1933. Annélides polychètes du Golfe du Pei Tcheu Ly de la collection du Musée Hoang ho Pai ho. Publ. Mus. Hoang ho Pai ho Tien Tsin, no. 15, 67 pp., 14 figs.

GRUBE, ADOLPH EDUARD.

1868. Beschreibungen einiger von Georg Ritter von Frauenfield gesammelter Anneliden und Gephyreen des rothen Meeres. Verh. zool.-bot. Ges. Wien, vol. 18, pp. 629–650.

1869. Beschreibungen neuer oder weniger bekannter von Hrn. Ehrenberg gesammelter Anneliden des rothen Meeres. Monatsb. Akad. Wiss. Berlin, 1869, pp. 484–521.

MARENZELLER, EMIL VON.

1879. Südjapanische Anneliden, I. Denkschr. Akad. Wiss. Wien, vol. 41, pt. 2, pp. 109–154, 6 pls.

1884. Südjapanische Anneliden, II. Denkschr. Akad. Wiss. Wien, vol. 49, pt. 2, pp. 197–224, 4 pls.

MCINTOSH, WILLIAM CARMICHAEL.

1885. Report on the Annelida Polychaeta collected by H. M. S. *Challenger* during the years 1873–76. Challenger Reports, Zool., vol. 15, xxxvi+554 pp., 93 pls., map.

MONRO, CHARLES CARMICHAEL ARTHUR.

1934. On a collection of Polychaeta from the coast of China. Ann. Mag. Nat. Hist., ser. 10, vol. 13, pp. 353–380, 10 figs.

PALLAS, PETER SIMON.

1766. Miscellanea zoologica, 12+224 pp., 14 pls. (Ed. 2, 1778.)

SOUTHERN, ROWLAND.

1921. Polychaeta of the Chilka Lake and also of fresh and brackish waters in other parts of India. Mem. Indian Mus., vol. 5, no. 8, pp. 563–659, 18 figs., 13 pls.

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